

<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	10/807,690	KIM ET AL.	
	Examiner Maria Veronica D. Ewald	Art Unit 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to 9/14/06.
2.  The allowed claim(s) is/are 1,2,5-7,9,12-15 and 17-22.
3.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All
  - b)  Some\*
  - c)  None
  1.  Certified copies of the priority documents have been received.
  2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftsperson's Patent Drawing Review ( PTO-948)
3.  Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_.
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_\_.

***Allowable Subject Matter***

Claims 1 – 2, 5 – 7, 9, 12 – 15, 17 – 22 are allowed. The following is an examiner's statement of reasons for allowance: With respect to independent claim 1, Applicant has amended claim 1 to state that the plurality of expansion slits have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured, wherein each of the plurality of expansion slits has a larger length in a range of 2.5 times to 5 times than the width thereof in an expansion section and a larger length in a range of 3.5 times to 10 times than the width thereof in a cooling section. Applicant persuasively argued that the closest prior art references of Reifenhauser (U.S. 3,990,828) and Mahoney, et al. (U.S. 6,863,856) both fail to teach expansion tubes wherein the expansion slits have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured. Examiner agrees. With respect to the reference of Reifenhauser, Reifenhauser teaches a plurality of equally-sized, angularly equispaced and longitudinally extending slits; however, the slits *do not have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured*. With respect to the reference of Mahoney, et al., Mahoney, et al. teach an expansion tube with equally-spaced, longitudinal slits that can be sized according to the user's needs, as shorter rectangular slits, longer slits or as holes; however, the slits are equally-sized along the tube's periphery and *do not have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured*.

With respect to independent claim 12, Applicant has amended claim 12 to state that the interval of the adjacent left and right expansion slits is the width or less of each

expansion slit with respect to the inner peripheral surface of the expansion tube. Furthermore, Applicant has argued that Aoshima, Lehtinen and Mahoney, et al. do not teach that there are cooling nozzles transporting water from the cooling water pump to the expansion tube and that all three references do not teach that the gap between slits is the width or less of the expansion slit. Examiner agrees. With respect to the reference of Aoshima (U.S. 5,071,886), Aoshima teaches a cooling bath but is silent with respect to a cooling water pump and cooling nozzles. With respect to the reference of Lehtinen (U.S. 5,516,270), *Lehtinen teach an expansion tube with a series of cooling water channels or slits on the inner peripheral surface of the tube, which is surrounded by a sleeve, the outer periphery of which contains grooves configured circumferentially.* These circumferential grooves form a lubricating channel system. In addition, Lehtinen does not teach that the cooling water is circulated or delivered to the tube via cooling nozzles, the tube's channels circulate the water and do not utilize any cooling nozzles. Lehtinen also does not teach that the expansion slits on the inner periphery are spaced such that the width between them is less than or equal to the slit width. With respect to the reference of Mahoney, et al., Mahoney, et al. also do not teach that the width between the expansion slits is less than or equal to the slit width, with respect to the inner peripheral surface of the expansion tube.

Thus, prior art fails to teach the following: an expansion tube having a plurality of expansion slits formed along a longitudinal direction on the outer peripheral surface thereof, each of the expansion slits having a predetermined width and a relatively larger length than the predetermined width; wherein the plurality of expansion slits have

lengths gradually increased along a direction to which the heat shrinkable tube is manufactured; and wherein each of the plurality of expansion slits has a larger length in a range of 2.5 times to 5 times than the width thereof in an expansion section and a larger length in a range of 3.5 times to 10 times than the width thereof in a cooling section. Furthermore, prior art fails to teach: an apparatus for manufacturing a heat shrinkable tube, having an expansion tube, comprising: a denser that is adapted to receive a heat shrinkable tube, while preventing the heat shrinkable tube from being loose; dry heating rolls that are adapted to heat the heat shrinkable tube ejected from the denser; an expansion chamber that is adapted to expand the heat shrinkable tube ejected from the dry heating rolls; a caterpillar that is adapted to have the heat shrinkable tube constant in diameter; and a bobbin that is adapted to wind the heat shrinkable tube ejected from the caterpillar, wherein the expansion chamber comprises the expansion tube in which the heat shrinkable tube is expanded to predetermined radius, a vacuum pump for discharging the air in the expansion tube, a cooling water pump for supplying cooling water to the expansion tube, a plurality of cooling water nozzles for spraying cooling water supplied from the cooling water pump, and a vacuum suction hole disposed between the wall surface of a body of the expansion chamber and the vacuum pump, for discharging the air in the expansion tube to the outside of the expansion chamber, and wherein the expansion tube has a plurality of expansion slits formed on the outer peripheral surface thereof along a longitudinal direction, each of the expansion slits having a predetermined width and a relatively larger length than the predetermined width; wherein an interval of the adjacent left and right expansion slits is

the width or less of each expansion slit with respect to the inner peripheral surface of the expansion tube.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated  
information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVE

  
JAMES P. MACKEY  
PRIMARY EXAMINER

12/11/06